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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,375	09/28/2001	Jong-Seo Choi	P56533	2237

7590 01/18/2006  
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EXAMINER

QUARTERMAN, KEVIN J

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/964,375

Applicant(s)

CHOI ET AL.

Examiner

Kevin Quarterman

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7,10,12,16,17,20-22,29,48-53,55-70,72-74,76,77 and 79 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,12,29,51-53,55,57-70,72-74 and 76 is/are allowed.
- 6) ☒ Claim(s) 10,16,17,48-50,56,77 and 79 is/are rejected.
- 7) ☒ Claim(s) 20-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1205.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 02 December 2005 has been entered.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 48-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. , Regarding claim 48, the word "means" is preceded by the word(s) "layer" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

7. Due to their dependency upon independent claim 48, claims 49 and 50 are also indefinite.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 10, 17, 56, 77, and 79 are rejected under 35 U.S.C. 102(e) as being anticipated by Saitoh (US 6,376,976).

10. Regarding independent claim 10, Figure 1 of Saitoh shows a cathode for an electron tube comprising a metal base (1) and an electron-emitting material layer (3) coated on the metal base, the electron-emitting material layer comprising a needle-shaped conductive material (5) and having a surface roughness corresponding to a distance between a highest point and a lowest point on a surface of the electron-emitting material layer being less than 10 microns (col. 7, ln. 37-40).

11. Regarding independent claim 17, Figure 1 of Saitoh shows a cathode for an electron tube comprising a metal base (1) and an electron-emitting material layer (3) coated on the metal base, the electron-emitting material layer comprising a needle-shaped conductive material (5) and a thickness of the electron-emitting material layer being in a range of 30 to 80 $\mu$ m (col. 8, ln. 38-41).

12. Regarding independent claim 56, Figure 1 of Saitoh shows a cathode comprising a metal base (1); a layer of electron-emitting material (3); a needle-shaped electrically conductive material (5) providing electrically conductive paths disposed throughout the layer of electron-emitting material, the layer of electron-emitting material having a thickness in a range of 30 microns to 80 microns (col. 8, ln. 38-41).

13. Regarding independent claim 77, Figure 1 of Saitoh shows a cathode comprising a metal base (1) and a layer (3) formed on the base from a carbonate paste comprising a barium-based carbonate electron-emitter and a needle-shaped electrically conductive powder (col. 6, ln. 4-7), the layer having a thickness in a range of 30 microns to 80 microns (col. 8, ln. 38-41).

14. Regarding claim 79, Saitoh discloses the electron-emitting material layer having a surface roughness corresponding to a distance between a highest point and a lowest point on a surface of the electron-emitting material layer being less than 10 microns (col. 7, ln. 37-40).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saitoh (US 6,376,976).

18. Regarding claim 16, Saitoh teaches the limitations of independent claim 10 discussed earlier but fails to exemplify the needle-shaped conductive material in the

electron-emitting material layer being in a range of 0.01 to 30% by weight based on a total weight of the electron-emitting material.

19. Saitoh does not explicitly disclose a particular amount for the needle-shaped conductive material but does disclose that the amount of the needle-shaped conductive material is more than the amount of a second material included in the electron-emitting material layer (col. 5, ln. 44-54).

20. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the needle-shaped conductive material in the electron-emitting material layer of Saitoh being in a range of 0.01 to 30% by weight based on a total weight of the electron-emitting material, since where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum ranges by routine experimentation (MPEP § 2144.05)

***Allowable Subject Matter***

21. Claims 7, 12, 29, 51-53, 55, 57-70, 72-74, and 76 are allowed.

22. Claims 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter: Regarding independent claim 7, the prior art of record neither shows or suggests a cathode for an electron tube comprising, in addition to other limitations of the claim, an electron-emitting material layer comprising a needle-shaped conductive

material being a carbonaceous material in a range of 0.01 to 30% by weight based on a total weight of the electron-emitting material layer.

24. Regarding independent claim 12, the prior art of record neither shows or suggests a cathode for an electron tube comprising, in addition to other limitations of the claim, an electron-emitting material layer comprising a needle-shaped conductive material being at least one material selected from a group consisting essentially of indium tin oxide, nickel, magnesium, rhenium, molybdenum, and platinum.

25. Regarding independent claim 29, the prior art of record neither shows or suggests a cathode for an electron tube comprising, in addition to other limitations of the claim, an electron-emitting material layer comprising a needle-shaped conductive material being a carbonaceous material in a range of 0.01 to 30% by weight based on a total weight of the electron-emitting material layer.

26. Regarding independent claim 51, the prior art of record neither shows or suggests a cathode comprising, in addition to other limitations of the claim, a needle-shaped electrically conductive material providing electrically conductive paths disposed throughout a layer of electron-emitting material, the needle-shaped electrically conductive material having a specific resistance not greater than  $10^{-1}$  ohms centimeter. Due to their dependency upon independent claim 51, claims 52-53 and 55 are also allowable

27. Regarding independent claim 57, the prior art of record neither shows or suggests a cathode comprising, in addition to other limitations of the claim, a layer comprising an electron-emitting material and a needle-shaped electrically conductive

material disposed within the layer and having a specific resistance less than a specific resistance of the electron-emitting material. Due to their dependency upon independent claim 57, claims 58-62 are also allowable.

28. Regarding independent claim 63, the prior art of record neither shows or suggests a cathode comprising, in addition to other limitations of the claim, a layer comprising an electron-emitting material and a needle-shaped electrically conductive material having a specific resistance not greater than  $10^{-1}$  ohms centimeter. Due to their dependency upon independent claim 63, claims 64-67 are also allowable.

29. Regarding independent claim 68, the prior art of record neither shows or suggests a cathode comprising, in addition to other limitations of the claim, a layer of electron-emitting material including a needle-shaped electrically conductive material having a specific resistance not greater than  $10^{-1}$  ohms centimeter. Due to their dependency upon independent claim 68, claims 69-70 are also allowable.

30. Regarding independent claim 72, the prior art of record neither shows or suggests a cathode comprising, in addition to other limitations of the claim, a layer including a needle-shaped electrically conductive powder having a specific resistance not greater than  $10^{-1}$  ohms centimeter. Due to their dependency upon independent claim 72, claims 73-74 are also allowable.

***Contact Information***

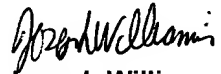
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quarterman whose telephone number is (571) 272-2461. The examiner can normally be reached on M-TH (7-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Quarterman  
Examiner  
Art Unit 2879

kq   
10 January 2006

  
Joseph Williams  
Primary Examiner  
Art Unit 2879